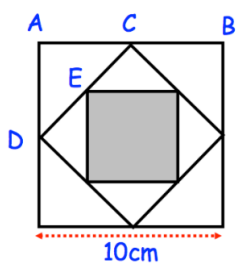
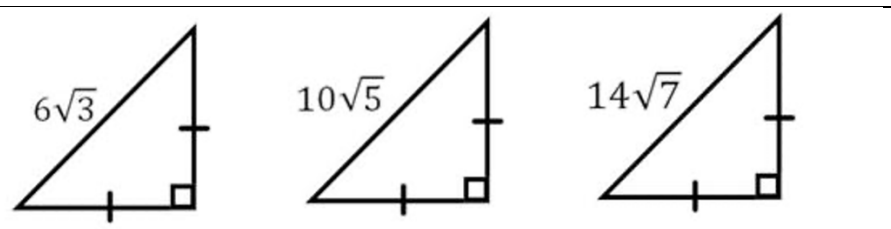
Surds (5) Pair Challenges – **non calculator**

1	Simplify $\frac{1}{1+\frac{1}{\sqrt{2}}}$	6	Show clearly that the mean and median of $\sqrt{3},\ \sqrt{12},\ \sqrt{48}$ and $\sqrt{75}$ are equal.
2	Simplify $(\sqrt{a}+\sqrt{4b}\,)(\sqrt{a}-2\sqrt{b}\,)$	7	Complete the multiplication table. $\times$ | | $2\sqrt{6}$ | $\sqrt{6}-2$ | $2\sqrt{6}+6$ | 1
3	Write $\frac{26}{\sqrt{2}}-\frac{12}{\sqrt{18}}+2\sqrt{50}$ in the form $a\sqrt{2}$, where a is an integer to find	8	On the number line shown below, a is a number between 0 and 1, and b is a number between 1 and 2. Mark possible positions on this line for $\sqrt{a},\ \sqrt{b},\ a^2,\ b^2$ and $\sqrt{\frac{b}{a}}$
4	The midpoints of the sides of a square 10cm are joined to form another square. This process is repeated to create a shaded square. Find the area of the shaded square. 	9	 These triangles all share a rather wonderful property. Find the shorter sides and you'll see! Can you find other triangles with this property?
5	Simplify $\sqrt{1+\frac{1}{2}}\sqrt{1+\frac{1}{3}}\sqrt{1+\frac{1}{4}}\sqrt{1+\frac{1}{5}}\sqrt{1+\frac{1}{6}}\sqrt{1+\frac{1}{7}}$	10	Find the sum of $\frac{1}{\sqrt{1}+\sqrt{2}}+\frac{1}{\sqrt{2}+\sqrt{3}}+$ and so on up to $+\frac{1}{\sqrt{99}+\sqrt{100}}$